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REMARKS ON THE SURGICAL TREATMENT OF OBSTETRICAL PARALYSIS.

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From the clinical standpoint cases of obstetrical paralysis may be divided into three classes:

1st. Those cases seen soon after birth, in which the paralysis may be combined with other, and what is often considered more serious injury, such as fracture.

2d. The cases brought for treatment during the latter part of the first year, when it has become apparent that complete recovery is doubtful.

3d. The cases seen in childhood and adolescence when treatment is sought in the hope that the disabled arm may be made more useful.

In the first class there is often sensitiveness to pressure about the shoulder and evident pain on movement of the arm. The paralysis may be of typical distribution or more widespread, so that the fingers are habitually flexed, or powerless..

In the second class, in which recovery has been incomplete, the accommodative contraction of muscles and other tissues limiting motion in the directions opposed to the habitual attitude, induced by the paralysis, is usually well marked.

¹Read at a meeting of the New York Neurological Society, April 5, 1904.

In the third class, if the paralysis has been of the typical form in which the deltoid, the flexors of the forearm and supinators are involved, there is often fixed inward rotation of the extremity and subluxation of the head of the humerus. If, however, as is not unusual in cases of this type, the paralysis is more general in its distribution, the subluxation, which is dependent on irregular muscular action is absent. The nutritive changes, induced directly by the injury and secondarily by disuse of normal function, evident in the atrophy and loss of growth of the limb may be extreme.

The treatment of the injury in early infancy during the stage of repair, when movement causes pain, is obviously rest, and the infant's arm should be fixed to the chest with the fingers extended.

Gentle massage, flexion, extension and supination of the forearm, manipulation of the fingers and the like should be employed, and as soon as the local sensitiveness has subsided the same treatment should be applied at the shoulder.

In the second class, in which contractions have already appeared, manipulation and forced movements at each joint with the aim of regaining the entire range of normal motion, is the first essential, combined with systematic exercises as far as is compatible with the intelligence of the patient. For by such training, as is well known, the disability due to incomplete paralysis from any cause may be materially lessened.

After how long a time recovery from paralysis, due to injury of the nerve trunks is possible, it is difficult to say. I have seen it delayed nearly a year after direct injury to the sciatic nerve, and, as is well known, the paralysis caused by forcible manipulation in the reduction of congenital dislocation of the hip may persist for many months.

It is during this period of repair of lesions of the nervous system of whatever type that progressive distortions occur, of which the indications may be seen within a very short time after the onset of the paralysis. These secondary distortions in themselves prevent recovery, and it is never possible to estimate the degree of irremediable injury to the nervous apparatus until they are overcome.

In orthopedic practice, for example, after rectification of de-

deformity of long standing, due to anterior poliomyelitis, in which contractions have been overcome and over-stretched muscles have been relaxed and the part enabled by proper protection to take on improved function, one often sees remarkable gain in power even in those muscles whose function has long been dormant and apparently hopelessly lost. It is the improvement due to removal of deformity, to the improved function that it permits, and to the education of the disabled apparatus that one must always consider before estimating the value of an operation as simple as tendon transplantation. It is evident, therefore, that the value of the more problematical operation of nerve anastomosis can only be estimated in the absence of contractions, and when sufficient time has elapsed to exclude the possibility of natural repair. It may be suggested in this connection that direct union of the injured nerves might be feasible if the operation were performed in infancy, and operative exploration with this aim might be considered in suitable cases.

The most important of the distortions due to obstetrical paralysis is the subluxation of the humerus in a direction downward and backward. In such cases the arm is slightly abducted, practically ankylosed at the shoulder and rotated inward so that the ulnar border of the hand may look forward. This attitude of habitual pronation, originally symptomatic of paralysis, has become exaggerated and confirmed by the secondary displacement, a displacement which even in the absence of paralysis would cause very serious disability, and in these cases it is often the most important obstacle to improved function. Cases of this character, if well marked, are often classified as congenital rather than acquired dislocation at the shoulder. True congenital misplacement may be present at birth, or displacement and injury to the nerves may occur simultaneously at birth. Of this I have seen one example during the past year, but that the luxation is in most instances secondary to habitual posture is indicated by the fact that although it is a common accompaniment of the disability in childhood and adolescence, it is very uncommon in the cases seen soon after birth. For a number of years I have examined all the cases of obstetrical paralysis coming under my observation at the Hospital for Ruptured and Crippled, and in but the one instance mentioned has actual subluxation been found while the infant

was in arms, although as he been stated, the contractions that oppose normal movements are often well marked.

It is in the reduction of the displacement of the humerus which should be the essential preliminary to any other treatment that I am particularly interested. The method that I have employed for a number of years in the treatment of this displacement, both congenital and acquired, has been somewhat similar to that of the reduction of congenital dislocation of the hip.

The patient, being anesthetized, the contractions are overcome by leverage of the arm, first in an elevated and extended attitude, the aim being to gradually force the head of the humerus forward. It is then pushed upward by lowering the arm, and finally by forcibly adducting it while the scapula is fixed as well as may be. The anterior part of the capsule is contracted and resistant, but as the head of the bone is usually atrophied, sufficient space may be gained by the manipulation to reduce the displacement at one sitting, but with older patients, or if the deformity is more extreme, it is better to divide the operations into two or more sittings. When the displacement has been reduced other contractions are stretched, for example, the forearm is forcibly supinated over and over again, and extended on the arm. The limb is then fixed, usually by adhesive plaster, and a plaster bandage with the elbow behind the thorax, and with the forearm, if practicable, in supination across the chest. This fixation is continued for a number of weeks, or months, in order to guard against redisplacement, and to permit the accommodative changes in the tissues about the joint. When it is removed, daily, more or less forcible manipulation must be carried out with the aim of preventing the tendency toward recurrence of the former attitude.

The usual routine in these passive movements is as follows: The scapula being fixed by one hand, the elbow is drawn behind the plane of the body with the other, in order to force the head of the humerus forward and upward. It is then adducted, and finally it is rotated outward over and over again, with the aim of increasing the capacity of the articulation. Extension of the forearm, supination and the like are employed to oppose muscular contraction, and such passive movements should be supplemented, of course, by the active efforts of the patient.

Not infrequently in these cases the initial injury of the nerve

trunks has been in great degree repaired, and when displacement and the secondary contractions which have caused the persistent disability have been removed, function is surprisingly improved under educational training, even to the extent of what may be called a practical cure. If, however, the paralysis of the deltoid muscle is complete, one must aim to hold the head of the humerus in the new position and in outward rotation until it becomes, by the contraction of the tissues, securely fixed there, or, if necessary, the attitude may be assured by arthrodesis, for in that event even when the ability to supinate is lost the radial border of the hand will look forward in place of the ulnar border, and this in itself is a great improvement.

If the injury to the brachial plexus has been more extensive the subluxation of the humerus, which is due to irregular muscular action, is not present, but the hand may be distorted and useless. In such cases operative treatment may be of value in lessening the disability.

Two cases of this character treated during the present year have been shown to-night.

The first patient, a girl 14 years of age, presented, on admission to the Hospital for Ruptured and Crippled, the following appearance: The right arm, as a result of injury at birth, was three and a half inches shorter than its fellow, the thumb was flexed on the palm and the fingers were clasped on it. There was slight power of flexion of the fingers but none of extension. The hand was drawn back into dorsal flexion, partly by the one active muscle, the extensor carpi radialis longior, and partly by the force of gravity, as the forearm was semi-flexed and supinated. There was slight power in part of the biceps, but apparently none in the deltoid. There was no subluxation. The obvious treatment in this case was to overcome the distortion of the hand. This was accomplished by arthrodesis of the metacarpo-phalangeal joint of the thumb. The same operation was performed at the wrist, and the active and deforming muscle was removed from its attachment and sewed to the extensor tendon of the fingers. The hand was fixed for a time in a plaster bandage, which was afterwards replaced by a removable appliance of lighter material. Under the treatment there has been a very great gain in power in the arm; there is fair power in flexion and a slight

power to extend the fingers and appose the thumb. The hand is symmetrical, and even without support it is useful for prehension.

In the second case, that of a girl of 18, there had been originally paralysis of both arms, but on the left side there had



Fig. I. The habitual attitude before operation. Case 1.

been a gradual gain in power, even during adolescence, as is instanced by the fact that within a few years she had been able to arrange her hair. The paralysis in this case and the attitude were similar to that which has been described. The deformity was overcome after arthrodesis at the wrist, by force and by use of a support there has been a considerable gain in function as well as the improvement in appearance.

This class of cases is, of course, far less important than the others and the treatment has only been mentioned incidentally.

The purpose of this paper has been to call attention to the importance of preventing secondary distortion after obstetrical

paralysis by systematic passive movements at all the joints of the disabled member in the directions opposed by the muscular adaptation that follows paralysis and habitual posture.



Fig. II. After operation. Case I.

2d. To the importance of subluxation of the humerus in increasing the disability and a method by which it may be remedied.

3d. To a class of secondary operations by which it is possible to lessen disability in the more extreme cases.